

DERWENT-ACC-NO: 1991-086843

DERWENT-WEEK: 199112

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TITLE: SRAM cell with reduced area - uses
trench pull-down transistors and buried-layer ground
plate

INVENTOR: HSU, F C

PATENT-ASSIGNEE: INTEGRATED DEVICE TECHNOLOGY[INTEN]

PRIORITY-DATA: 1989US-0385663 (July 25, 1989) ,
1987US-0069168 (July 2, 1987)
, 1988US-0236209 (August 23, 1988)

PATENT-FAMILY:

PUB-NO	PAGES	PUB-DATE	
LANGUAGE		MAIN-IPC	
US 4997783 A		March 5, 1991	N/A
000	N/A		

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO
APPL-DATE		
US 4997783A	N/A	
1989US-0385663	July 25, 1989	

INT-CL (IPC): H01L021/70

RELATED-ACC-NO: 1989-008645, 1991-044178

ABSTRACTE1-PUB-NO: US 4997783A

BASIC-ABSTRACT:

Method comprises forming an isolated, buried n+ layer on a p-substrate, growing an epitaxial Si layer on this in which p-wells and the active island regions are formed, and performing a pull-down transistor threshold

voltage adjustment.

After masking, at least two trenches are etched into the epitaxial layer so that their bottoms are in the buried layer, which interconnects them. A dielectric layer is formed in the trench and a conductor layer as a gate electrode for at least two trench transistors as well as a gate for two surface transistors.

Also claimed is a method as above with the additional steps of forming a dielectric and patterning for at least one via hole, forming a second conductive layer and implanting to form loads and interconnections followed by insulators, contact hole openings, metal line definition and passivation.

USE/ADVANTAGE - The SFAM cell (claimed) of 4T-2R type has a much reduced cell area. A high density SRAM is thus possible as is a 6T SRAM with non-self-aligned poly-Si p-channel pull-up transistors without increasing the area significantly. Channel length is insensitive to trench depth variations and the refill/etch/refill process is not needed.

CHOSEN-DRAWING: Dwg.4/8

TITLE-TERMS: SFAM CELL REDUCE AREA TRENCH FULL DOWN
TRANSISTOR BURIED LAYER
GROUND PLATE

DERWENT-CLASS: L03 U14

CPI-CODES: L03-G04A; L04-C01; L04-C06;

EPI-CODES: U14-A03B1;

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1991-036894
Non-CPI Secondary Accession Numbers: N1991-067129

L Number	Hits	Search Text	DB	Time stamp
1	338312	interconnect interconnection	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 22:02
2	485186	(semiconductor si silicon gaas) with substrate	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 22:03
3	15930	buried and (epi epitaxial epitaxially)	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 22:05
4	2683	((interconnect interconnection) and ((semiconductor si silicon gaas) with substrate) and (buried and (epi epitaxial epitaxially))	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 23:05
5	97922	(epi epitaxial epitaxially)	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 22:05
6	117122	buried	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 22:05
7	145	((interconnect interconnection) same ((semiconductor si silicon gaas) with substrate) same ((epi epitaxial epitaxially)) same buried	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 22:06
8	1336	((interconnect interconnection) and ((semiconductor si silicon gaas) with substrate) and (buried and (epi epitaxial epitaxially))) and (high with (current power))	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 23:08
9	1279	((interconnect interconnection) and ((semiconductor si silicon gaas) with substrate) and (buried and (epi epitaxial epitaxially))) and (high with (current power))) not ((interconnect interconnection) same ((semiconductor si silicon gaas) with substrate) same ((epi epitaxial epitaxially)) same buried)	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 23:08
10	1279	((interconnect interconnection) and ((semiconductor si silicon gaas) with substrate) and (buried and (epi epitaxial epitaxially))) and (high with (current power))) not ((interconnect interconnection) same ((semiconductor si silicon gaas) with substrate) same ((epi epitaxial epitaxially)) same buried))	USPAT; US-PGPUB; EPC; JPO; DEFWENT; IBM_TIB	2003/04/28 23:09